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Alumeda n.g., a New Bug Genus Erected for Three Fossil Species from Dominican Amber (Heteroptera: Reduviidae, Emesinae)

By Yuri A. Popov, Moscow

With 20 figures

Summary

For three new fossil species from Dominican Amber deriving from the suggested Lower Miocene of Haiti/Hispaniola a new genus of the peculiar carnivorous bug subfamily Emesinae (Reduviidae) has been erected: *Alumeda nigricans* n. g., n. sp., *A. dominicana* n. sp., and *A. antilliana* n.sp. *Alumeda* n.g. joins the tribe Ploiariolini, within which its particularly closely related genera are discussed. Presented is a new key for the genera closely related to *Alumeda* n.g. in the tribe Ploiariolini. It is presented a synopsis of the stability vs. variability of a number of external and coloration characters in three new species involved, as well as a key.

Zusammenfassung

Für drei neue Arten der eigentümlichen räuberischen Wanzen-Subfamilie Emesinae (Reduviidae) aus dem Dominikanischen Bernstein wird eine neue Gattung errichtet: *Alumeda* n. g. Der Dominikanische Bernstein stammt nach allgemeiner Ansicht aus dem Unteren Miocän von Haiti/Hispaniola. *Alumeda nigricans* n. g., n. sp., *A. dominicana* n. sp. und *A. antilliana* n.sp., die hier beschrieben werden, gehören zu der Tribus Ploiariolini. Die mit *Alumeda* nächstverwandten Gattungen werden besprochen, und ein neuer Bestimmungsschlüssel für diese Gattungen wird gegeben. Die Variabilität bzw. Stabilität von Farb- und Struktur-Merkmalen bei diesen Arten werden analysiert.

1. Introduction

The purpose of the present paper is to put on record a remarkable new Emesinae genus, *Alumeda* n. g., based on three extinct species, all from Dominican amber. Its age is considered Early Miocene according to stratigraphic and foraminiferal analyses by BARONI URBANI & SAUNDERS 1982. Till now, only one Heteroptera species has been described from Dominican amber: *Malacopus wygodzinskyi* POPOV 1987a. (In addition, one other Emesinae species from that region has been published from copal, i. e. a recent species embedded in hardened resin probably no more than a few centuries old: POPOV 1987b.)

The species described below belong to the tribe Ploiariolini which is nowadays abundant throughout the world and particularly rich in forms in both tropical and subtropical regions. Emesinae, as a whole, is a 'phylogenetically compact' and relatively easily recognizable group and seems promising for studies on dispersal and evolution in a Tertiary West Indian fauna. Yet, despite the grand revision by WYGODZINSKY (1966), the recent fauna seems only fragmentarily known concerning both species number and morphology. In order to improve the situation I intended to provide a more extended morphological comparison.

Acknowledgements

Thanks are due to the staff of the Staatliches Museum für Naturkunde, Stuttgart, for help and facilities during my visit in 1982, and to Dr. S. Golovatch, Moscow, who checked the English of the final manuscript.

2. Analysis of some generic characters

Alumeda n. g. (diagnosis and description see below) doubtlessly joins the group of genera in the tribe Ploiariolini (i. e. *Empicoris*, *Ctydinna*, *Ademula*, *Malacopus*, and *Panamia*) sharing a single longitudinal vein M+Cu emitting from the base of the discal cell. An analysis of phylogenetic relationships between these genera has not yet been achieved (even the systematic position of the tribe Ploiariolini among the Emesinae is questionable according to WYGODZINSKY 1966: 92). A comparison of major characters of *Alumeda* and the other Ploiariolini genera seems necessary.

The new genus *Alumeda* differs from all the other known Ploiariolini genera by the following characters:

- (1) *Alumeda* has the shortest pterostigma which is no less than twice as long as the distance from the pterostigmal apex to insertion of M on the same. In *Empicoris* and *Ctydinna* the distance is shorter, in *Ademula*, *Malacopus*, and *Panamia* the apex of the pterostigma reaches the wing tip or nearly so.
- (2) The base of the discal cell is shortly pointed. In *Empicoris* and *Ctydinna* it is shortly truncate, in *Ademula*, *Malacopus*, and *Panamia* narrowly pointed.
- (3) Only a basal quarter or fifth of the anterior border of the discal cell is separated from the wing margin. In *Empicoris* and *Ctydinna* this is a basal half, in *Ademula*, *Malacopus*, and *Panamia* the anterior border of the cell is fused for most of its length.

Among the Ploiariolini genera there is some „overall similarity“ between *Empicoris* and *Ctydinna* on the one hand, and between *Ademula*, *Malacopus*, and *Panamia* on the other. *Alumeda* shares characters with both in varying combinations, indicating that these similarities may be partly based on convergences/parallelisms and/or symplesiomorphies. Thus, the grouping-together is rather a cluster than a (monophyletic) group. No phylogenetic conclusions should be drawn from that state of knowledge. The shared characters are as follows: distance between the apices of both pterostigma and forewing (like in *Empicoris* and *Ctydinna*); one oblique vein connecting the independent basal part of the discal cell (like in *Ademula*, *Malacopus*, and *Panamia*); R+M and Cu of the hind wing not connected beyond the cross vein m-cu (like in all the genera except for *Malacopus*); pronotum without median projection in front of hind margin (like in the majority of *Empicoris* spp., *Ctydinna*, *Malacopus*, *Ademula*, and *Panamia*); pronotum not carinate laterally (like in *Ctydinna*, *Malacopus*, *Panamia*); scutellum spineless (like in some *Empicoris* spp., *Panamia*);

metanotum with a median longitudinal ridge (like in *Ademula*); 1st abdominal segment with a spine (spineless only some *Empicoris* spp.); 2-segmented tarsi (like in *Empicoris*, *Ctydinna*).

WYGODZINSKY (1966) stated that *Ademula* is a vicariant, geographically as well as taxonomically, of *Malacopus*; both are considered closely related. *Ademula* spp. are known to occur in the Ethiopian, Oriental, and Australian realms, whereas *Malacopus* is neotropical. The fossil *Malacopus* and *Alumeda* species provide evidence for a considerable diversity during Tertiary times, and demonstrate that Emesinae have been living in the Caribbean region at least since the Miocene.

3. Key to the genera closely related to *Alumeda* n. g.

- 1 (6) Apex of pterostigma reaches wing tip, or nearly so; base of discal cell narrowly pointed; anterior border of cell fused for most of its length, independent at extreme base, connected to wing margin by one cross vein only; fore tarsi three-segmented.
- 2 (5) Scutellum spined; pterostigma reaches wing tip.
- 3 (4) Metanotum rounded apically, or with a very short process only; pronotum with lateral carinae *Ademula*
- 4 (3) Metanotum with a distinct slender spine; pronotum not carinate laterally . *Malacopus*
- 5 (2) Scutellum lacking spine; pterostigma nearly reaches wing tip *Panamia*
- 6 (1) Apex of pterostigma not reaching wing tip; base of discal cell and independent length of basal part of it different; fore tarsi two-segmented.
- 7 (10) Distance from apex of pterostigma to tip of forewing about as large as, or somewhat larger than distance from pterostigmal apex to insertion of M on same; base of discal cell shortly truncate, basal half of anterior border of cell separated from wing margin and connected to it by two oblique cross veins.
- 8 (9) Head, thorax and basal abdominal sternite glabrous, polished; pronotum not carinate laterally; wing pattern formed by large vittae. *Ctydinna*
- 9 (8) Head, thorax and basal abdominal sternite dull as rest of body, with short, adpressed pubescence; pronotum with distinct, generally extensive, lateral carinae; wing pattern formed by numerous small spots *Empicoris*
- 10 (7) Distance from apex of pterostigma to tip of forewing no less than twice as long as distance from pterostigmal apex to insertion of M on same; base of discal cell shortly pointed, only a basal quarter or fifth of anterior border of cell separated from wing margin and connected to it by one cross vein *Alumeda* n. g.

4. Description of the new genus

Alumeda n. g.

Type species: *Alumeda nigricans* n. sp.

Derivatio nominis: An anagram of *Ademula*, a genus of Emesinae.

Description. — Macropterous. Small (3.4–4.6 mm). Body surface mostly dull, with short hairs. General coloration (which may be altered in the fossils) of head and thorax light brown to black; abdomen and extremities ochraceous; legs and antennae sparsely annulated with dark; forewings with more or less conspicuous pattern elements, latter of forewings formed by simple spots; pterostigma mostly dark, with light apex; hind wing colourless.

Head short, anteocular and postocular parts of equal length, both elevated dorsally. Eyes large, semiglobular or globular, as high as head, i. e. reaching to level of dorsal and vertical surface of head; eye longer than postocular part in lateral view. Antenniferous tubercles large; antennae near apex of head, first and second joints much longer than joints 3 and 4 combined, antennal joint 1 with numerous characteristic internal rings, its apex distinctly narrowed to tip.

Pronotum completely covering mesonotum, subrectangular, generally slightly widened posteriorly; a slight constriction before middle; hairless. Anterior lobe much wider than long. Posterior lobe slightly shorter than wide; lateral carinae absent, posteriorly before hind margin without median projection; humeral angles with flap-like lateral outgrowths. Scutellum very short, without spine. Metanotum with a median longitudinal ridge, spine absent.

Fore legs slender, femur 1 with a posteroventral series of processes consisting of many (16–18) short delicate spines which begin at the base of the article and are interrupted at the middle of the femur, anteroventral series composed of numerous stiff setae; fore tibia quite slender, $\frac{3}{4}$ th as long as femur, ventrally with a series of strong decurved setae; fore tarsi about a quarter as long as tibia, two-segmented, joint 1 half as long as joint 2; claws of equal size. Middle and hind femora dorsally covered with numerous very short, rather dense, delicate and ventrally short hairs.

Surface of forewing smooth, semihyaline, with only one large discal cell slightly pointed or not at apex, base of discal cell shortly pointed, independent basal part of anterior border as long as $\frac{1}{4}$ – $\frac{1}{5}$ th of its fused part, base of discal cell connected by one short oblique vein to costal margin of wing. Only one longitudinal vein M+Cu emitting from base of discal cell. Pterostigma falling far off wing tip. Venation of hind wing complete; Cu and R+M not connected beyond cross vein; simple M+Cu very long. Abdomen elongate, very narrow at base, moderately widened caudad, widest at posterior third; surface of abdomen shining.

Composition. – Besides the type species *A. nigricans* n. sp., *Alumeda* n. g. comprises *A. dominicana* n. sp. and *A. antilliana* n. sp., all from Dominican amber of Haiti/Hispaniola.

5. Key to species of *Alumeda* n. g.

- 1 (4) Eyes semiglobular, slightly longer than postocular region in lateral view (Fig. 2, 11). Pterostigma rather long, distance from apex to tip of wing twice as long as distance from pterostigmal apex to insertion of M on same; apical portion of discal cell somewhat pointed. Length over 4 mm.
- 2 (3) Femur about 16 times as long as maximum width. Spine of abdominal segment 1 very slender, over six times as long as wide (Fig. 15); pale forewings narrow, five times as long as wide (Fig. 16); discal cell three times as long as wide, its basal independent part $\frac{1}{4}$ th of its fused portion; wing pattern as in Fig. 16. Size 4.3–4.6 mm . . . *dominicana* n. sp.
- 3 (2) Femur about eight times as long as maximum width. Spine of abdominal segment 1 stout, four times as long as wide, dark (Fig. 6) forewings broader, slightly over 3.5 times as long as wide; discal cell 2.5 times as long as wide; its basal independent part $\frac{1}{5}$ th of its fused portion; wing pattern as in Fig. 7. Size 4.6 mm. *nigricans* n.sp.
- 4 (1) Eyes globular, three times as long as postocular region (Fig. 18). Pterostigma short, distance from apex to tip of wing three times as long as distance from pterostigmal apex to insertion of M on same; apical portion of discal cell not pointed. Size 3.4 mm . . . *antilliana* n. sp.

6. Description of the new species

Alumeda nigricans n. sp.

Figs. 1–8

Holotype: ♀ from Dominican amber of Haiti/Hispaniola. Deposited in SMNS, Inv.-Nr. Do-3319-E.

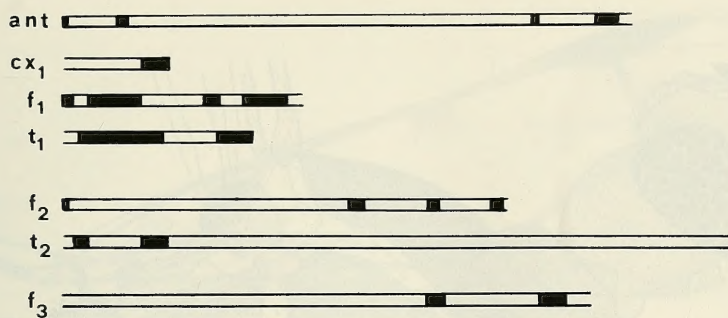


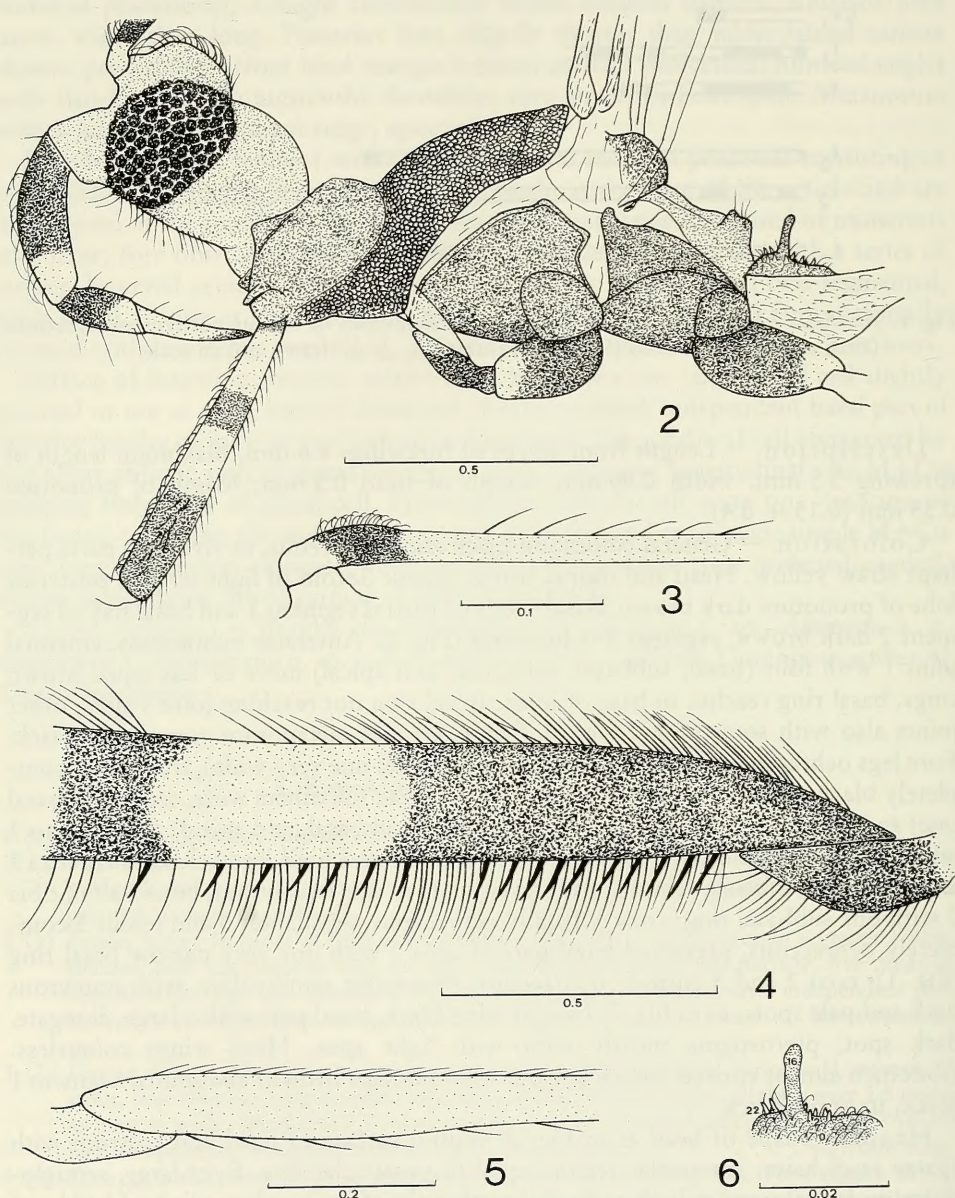
Fig. 1. *Alameda nigricans* n. sp., ♀ holotype. Distribution of colour patterns on antennae (ant), coxa (cx₁), femora (f₁, 2, 3) and tibiae (t₁, 2, 3); drawn not to scale.

Description. — Length from apices of forewings 4.6 mm, maximum length of forewing 3.5 mm, width 0.95 mm; length of head 0.5 mm; length of pronotum 0.55 mm (0.15 + 0.4).

Coloration. — General coloration black and ochraceous, in vivo pale parts perhaps straw yellow. Head and thorax black, almost devoid of light stripes; posterior lobe of pronotum dark brown. Basal $\frac{2}{3}$ of rostral segment 1 and basal half of segment 2 dark brown, segment 3 ochraceous (Fig. 2). Antennae ochraceous; antennal joint 1 with four (basal, subbasal, subapical, and apical) more or less equal brown rings, basal ring reaches to base of joint, apical ring not reaching joint's apex, other joints also with some rings (Fig. 1). Scutellum and metanotum completely black. Fore legs ochraceous; coxa 1 with three rings (apical one very wide), trochanter completely black, femur 1 with four (apical one narrow, the others wide, especially basal one) and tibia 1 with three (narrow medial, wide subbasal, and apical) rings, tarsus 1 with light joint 1 and dark joint 2 (Fig. 1). Middle and hind legs ochraceous; coxa 2 and trochanter 2 black, femur 2 with seven more or less equal rings, basal half of tibia 2 with one subbasal ring; coxa 3 distally ochraceous, trochanter 3 and femur 3 completely ochraceous, preserved basal part of tibia 3 with one very narrow basal ring (Fig. 1); tarsi 2 and 3 entirely ochraceous. Forewings semihyaline, with numerous dark and pale spots, as in Fig. 7; base of wing black, basal part with a large, elongate, dark spot, pterostigma mostly dark with light apex. Hind wings colourless. Abdomen almost entirely ochraceous, in vivo perhaps brown; abdominal segment 1 black, its spine black.

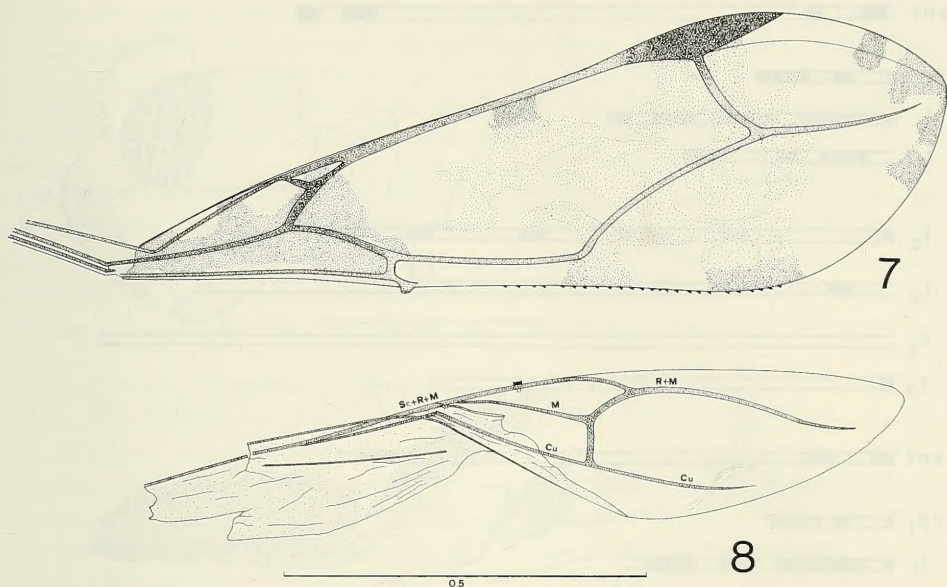
Head. — Shape of head as in Fig. 2; ventral surface of head and rostrum with sparse erect hairs; anteocular region equal to postocular one. Eyes large, semiglobular; in lateral view as high as head; length ratio of postocular region of head and eye as 1:1.23 in lateral aspect. Rostrum: joint 1 by about a quarter shorter than joints 2 and 3 combined (1:1.35), joint 2 slightly shorter than joint 3; length ratio of joints 1 to 3 being 1.7:1.0:1.3. Antennae clothed with short, sparse, delicate, and adpressed hairs and bristles, base of joint 1 along basal ring covered with quite dense, erect, very short hairs (Fig. 3); joint 4 with numerous characteristic internal rings, its apex distinctly narrowed towards tip; ratio of antennomeres 1–4 as 2.9:3.1:1.0:0.55.

Thorax. — Pronotum as in Fig. 2; surface rather smooth, hairless. Anterior lobe twice as short as posterior one; humeral angles of posterior lobe more or less deve-



Figs. 2–6. *Alameda nigricans* n. sp., ♀ holotype.

- 2: Head, thorax and abdominal segment 1 in lateral view.
- 3: Basal portion of antennal joint 1.
- 4: Basal portion of femur 1.
- 5: Basal portion of femur 3.
- 6: Spine of abdominal segment 1.



Figs. 7–8. *Alameda nigricans* n. sp., ♀ holotype.

7: Forewing.

8: Hind wing.

loped, humeri 1+1 laterally projecting flaplike as subvertical outgrowths. Scutellum short, semicircular (Fig. 2). Metanotum with a median longitudinal ridge supplied with some erect hairs (Fig. 2).

Legs. — Fore legs slender, clothed with short numerous hairs and bristles shorter than diameter of coxa and femur. Ratio of coxa 1, femur 1 and tibia 1 as 1.0:2.1:1.7. Coxa 1 rather slender, 7.5 times as long as wide; length ratio of femur 1 and tibia 1.3:1.0, each ca. 9 times as long as wide; basal half of femur 1 with a posteroventral row of numerous (17) short, delicate spines not exceeding half of femoral diameter (Fig. 4). Ratio of middle and hind femora as 1.0:1.3, both covered dorsally with very short, dense, delicate and ventrally short, numerous hairs (Fig. 5).

Wings. — Forewing apically rounded, with a slightly pointed tip; 3.6 times as long as wide; pattern and venation as in Fig. 7; distance from apex of pterostigma to tip of wing twice as long as distance from apex of pterostigma to insertion of M on same; discal cell ca. 2.5 times as long as maximum width, apical portion slightly pointed; independent basal part of anterior border of discal cell as long as $\frac{1}{5}$ th of its fused part. Venation of hind wing complete; m-cu very long (Fig. 8).

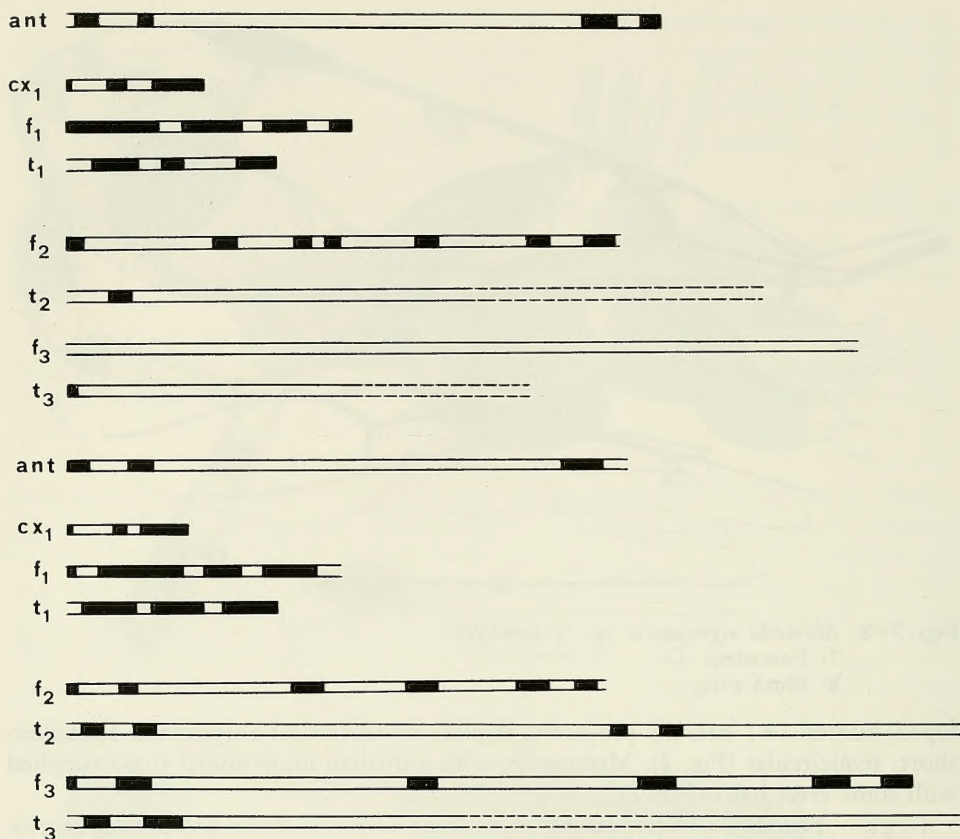
Spines. — Spine of abdominal segment 1 quite slender, four times as long as wide; there are some rather short, pale microdenticles and erect, short, delicate hairs on the dorsal surface of segment 1 (Figs. 2 & 6).

Alameda dominicana n. sp.

Figs. 9–16

Holotype: ♀ from Dominican amber of Haiti/Hispaniola. Deposited in SMNS, Inv.-Nr. Do-3043-E.

Paratype: ♂ from Dominican amber of Haiti/Hispaniola. Deposited in SMNS Inv.-Nr. Do-3067-E.



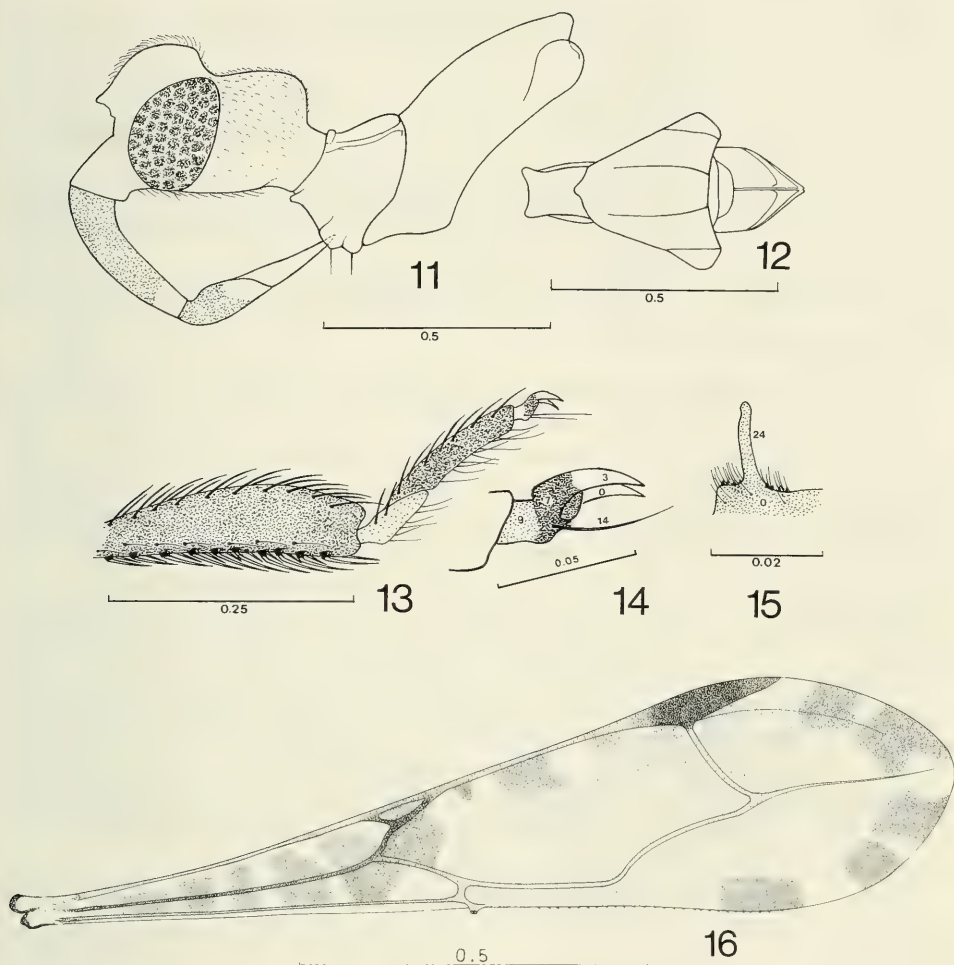
Figs. 9–10. *Alameda dominicana* n. sp. Distribution of colour patterns on antennae (ant), coxa (cx₁), femora (f₁, 2, 3) and tibiae (t₁, 2, 3); drawn not to scale.

9: ♀ Holotype.

10: ♂ Paratype.

Description. — Length from apices of forewings 4.3–4.6 mm, maximum length of forewings 3.4–3.5 mm, width 0.7 mm; length of head 0.5 mm; length of pronotum 0.65 mm (0.25+0.4), ♀ and 0.7 mm (0.25+0.45), ♂.

Coloration. — General coloration black and ochraceous, in vivo pale parts perhaps brown. Head and thorax black, without conspicuous light stripes; posterior lobe of pronotum slightly lighter, with a rubro-ochraceous area between two median longitudinal carinae. Basal $\frac{2}{3}$ of rostral segments 1 and 2 dark brown, segment 3 ochraceous. Antennae ochraceous; antennal joint 1 with three (basal and subbasal equally long, apical one wider) brown rings, apical ring not reaching to joint's apex (Figs. 9, 10). Scutellum and metanotum black, latter with lateral margins and median longitudinal ridge ochraceous. Fore legs ochraceous; coxa 1 with three rings (basal very wide), trochanter entirely black, femur 1 with four (basal very narrow, others very wide) rings and tibia 1 with three wide rings, tarsus 1 with pale joint 1 and dark joint 2, praetarsus black (Fig. 13). Middle and hind legs ochraceous; coxa 2 and distal half of trochanter 2 black, femur 2 with more or less equal six rings, except for narro-



Figs. 11–16. *Alumeda dominicana* n. sp.

- 11: ♀ Type, head and thorax in lateral view.
- 12: ♂ Paratype, thorax in dorsal view.
- 13: ♂ Paratype, distal part of tibia 1 and entire tarsus 1.
- 14: ♂ Paratype, claw of tarsus 1. The numbers indicate the depth relations, i. e. 0-0-0 is in plain level position, not oblique (according to SCHLEE & GLÖCKNER 1978).
- 15: ♀ Type, spine of abdominal segment 1.
- 16: ♀ Type, forewing.

west basal one, tibia 2 with four more or less equal rings; coxa 3 distally ochraceous, trochanter 3 ochraceous, femur 3 with six more or less equal rings, except for narrowest basal one; tarsi 2 and 3 completely ochraceous (Figs. 9, 10). Forewings semi-hyaline, with numerous dark and pale spots, as in Fig. 16; base of wings pale, basal part with five or six transversal stripes, pterostigma mostly dark, with a light apex; hind wings colourless. Abdomen almost entirely ochraceous, abdominal segment 1 black; its spine ochraceous.

Head. — Shape of head as in Fig. 11; ventral surface of head and rostrum with sparse erect hairs; antocular region equal to posterior one, with rather short, suberect dense hairs; postocular part covered with short suberect bristles. Eyes large, semiglobular, in lateral view as high as head; length ratio of postocular region and eye as 1.0:1.2 in lateral aspect. Rostrum: length ratio of joint 1 and joints 2 and 3 combined as 1.0:1.2 (Do-3043-E) or 1.0:1.25 (Do-3067-E), 2nd joint by a quarter shorter than 3rd, their ratio being as 1.9:1.0:1.3 (Do-3043-E) and 1.8:1.0:1.3 (Do-3067-E). Antennae clothed with short, rare, delicate, adpressed and suberect hairs and bristles, base of joint 1 along basal ring with quite dense, erect, very short hairs; joint 4 with numerous characteristic internal rings, its apex distinctly narrowed to tip; ratio of antennomeres 1–4 as 26:27:10:5 (Do-3043-E) and 26:27:?: (Do-3067-E).

Thorax. — Pronotum as in Figs. 11–12 (in lateral and dorsal aspects, respectively), surface rather smooth. Anterior lobe half as long as posterior one, length nearly equal to width; lateral margins form low vertical carinae; disc somewhat flattened. Posterior lobe slightly (1.2 times) as short as wide, with two median, longitudinal, delicate furrows, humeral angles of posterior lobe conspicuous, humeri 1+1 laterally projecting flap-like as subvertical outgrowths (Fig. 12). Scutellum very short, semicircular (Fig. 12). Metanotum with a median longitudinal ridge.

Legs. — Fore legs rather slender, clothed with numerous short hairs shorter than diameter of coxa or femur. Ratio of coxa 1, femur 1 and tibia 1 as 58:13:10 (Do-3043-E) and 55:13:10 (Do-3067-E). Coxa 1 rather slender, ca. 7.5 times as long as wide; length ratio of femur 1 and tibia 1 as 1.3:1, each ca. 17 times as long as wide; basal half of femur 1 with a posteroventral row of numerous (16–18), short, delicate spines not exceeding half of femoral diameter; tarsal joint 1 half as long as joint 2; claws of equal size, slightly curved (Fig. 14). Ratio of middle and hind femora as 1.0:1.6, dorsally covered with very short, dense, delicate and ventrally short, numerous hairs.

Wings. — Forewing apically rounded rather widely, five times as long as wide; pattern and venation as in Fig. 16; distance from apex of pterostigma to tip of wing twice as great as distance from apex of pterostigma to insertion of M on same; discal cell three times as long as its maximum width, apical portion slightly pointed; independent basal part of anterior border of discal cell as long as a quarter of its fused part.

Spines. — Spine of abdominal segment 1 very slender, more than 6 times as long as wide; there are some very short and dark microdenticles and erect, short, dense, delicate hairs on the dorsal surface of segment 1 (Fig. 15).

Alumeda antilliana n. sp.

Figs. 17–20

Holotype: ♂ from Dominican amber of Haiti/Hispaniola. Deposited in SMNS, Inv.-Nr. Do-3861-M-1.

Description. — Length from apices of forewings 3.4 mm., maximum length of forewings 2.6 mm, width 0.7 mm; length of head 0.38 mm; length of pronotum 0.42 mm (0.17+0.25).

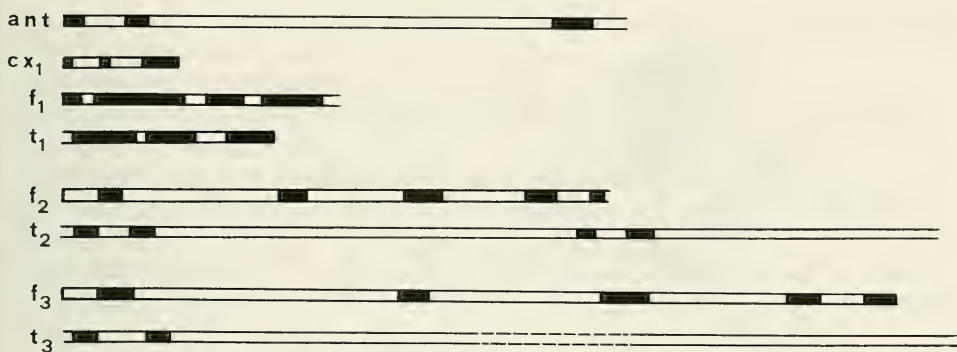


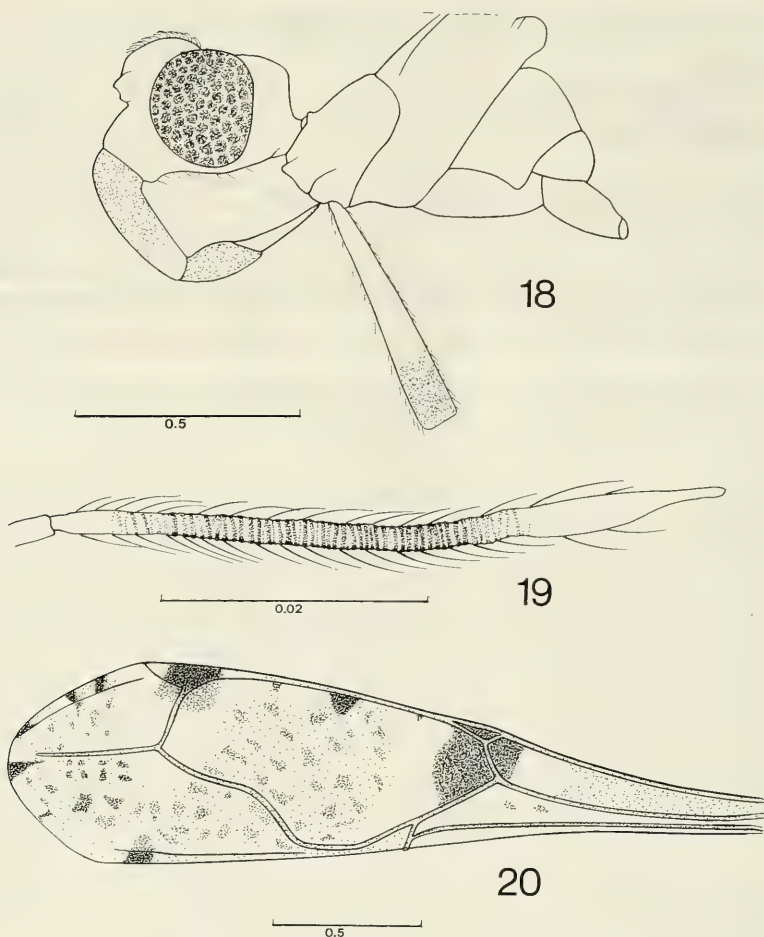
Fig. 17. *Alameda antilliana* n. sp., ♂ holotype. Distribution of colour patterns on antennae (ant), coxa (cx₁), femora (f₁, 2, 3) and tibiae (t₁, 2, 3); drawn not to scale.

Coloration. — General coloration light brown and ochraceous, in vivo perhaps rubro-ochraceous. Head dark brown, lighter anteriorly over insertion of rostral segment 1; basal $\frac{2}{3}$ rds of rostral segment 1 and segment 2 light brown, segment 3 ochraceous (Fig. 18). Antennal joint 1 with four (basal, subbasal and subapical narrow; apical wide) dark brown rings (Fig. 17). Scutellum and metanotum black, latter with lateral margins and median longitudinal ridge ochraceous. Fore legs ochraceous; coxa 1 with a wide apical ring only, trochanter completely dark brown, femur 1 with four (basal and medial narrow, subbasal and subapical very wide) and tibia 1 with two (basal very wide) rings only; tarsus 1 completely dark. Middle and hind legs ochraceous; coxa 2 and trochanter 2 light brown, femur 2 with four narrow rings, tibia 2 with two narrow subbasal rings; coxa 3 distally ochraceous, trochanter 3 completely ochraceous, femur 3 with two (medial and subapical) rings (Fig. 17). Forewings semihyaline, with several dark and numerous small light brown spots, as in Fig. 20; base of wings pale, basal part with some small spots; base of discal cell dark, pterostigma mostly dark, its apex light. Hind wings colourless. Abdomen entirely ochraceous, spine of abdominal segment 1 light brown.

Head. — Shape of head as in Fig. 18; ventral surface of head and rostrum with sparse erect hairs; anteocular region equal to postocular one. Eyes very large, globular, in lateral view as high as head; postocular region $\frac{1}{3}$ rd as long as eye in lateral aspect. Rostrum: length ratio of joints 1, 2 and 3 as 20:10:15. Antennae clothed with quite dense, erect, very short hairs and bristles; joint 4 with numerous characteristic internal rings, its apex distinctly narrowed towards tip (Fig. 19).

Pronotum as in Fig. 18; surface smooth, hairless. Anterior lobe half as long as posterior one; disc somewhat elevated. Lateral margins forming no carinae; humeral angles of posterior lobe more or less developed, humeri 1+1 laterally projecting flap-like as outgrowths. Scutellum short, rectangular. Metanotum with a median longitudinal ridge.

Legs. — Fore legs slender, clothed with very short hairs and bristles. Ratio of coxa 1, femur 1 and tibia 1 as 10:25:19. Coxa 1 rather slender, 8 times as long as wide; length ratio of femur 1 and tibia 1 as 13:10, each ca. 15 times as long as wide; basal half of femur 1 with a posteroventral row of numerous (16), short, delicate spines not exceeding half of femoral diameter. Ratio of middle and hind femora as 10:12, dorsally covered with very short, dense, delicate, and ventrally short, numerous hairs.



Figs. 18–20. *Alameda antilliana* n. sp., ♂ holotype.

18: Head and thorax in lateral view.

19: Antennal joint 4.

20: Forewing.

Wings. — Forewing apically rounded, 3.7 times as long as wide; pattern and venation as in Fig. 20; distance from apex of pterostigma to tip of wing three times as long as distance from apex of pterostigma to insertion of M on same; discal cell 2.3 times as long as its maximum width, apical portion not pointed; independent basal part of anterior border of discal cell as long as $\frac{1}{5}$ th of its fused part. Venation of hind wing complete; R+M and Cu not connected beyond cross vein m-cu, simple; m-cu very long.

Spines. — Spine of abdominal segment 1 slender and pale.

7. Analysis of the characters of *Alameda* species

As a base for the analysis I have chosen the characters of both coloration and external morphology in the new Dominican species *A. nigricans* n. sp., *A. domini-*

cana n. sp., and *A. antilliana* n. sp. with the aim to elucidate the stability vs. variability from species to species.

I have already emphasized elsewhere (POPOV, 1987a) that in the Emesinae coloration varies in some parts significantly, although it still displays certain species characters. Thus, the black coloration of both head and thorax in both *nigricans* n. sp. and *dominicana* n. sp. is quite similar, while in *antilliana* n. sp. they are light brown. *A. nigricans* n. sp. and *antilliana* n. sp. have four rings on antennomere 1; however, its basal and apical rings are arranged slightly differently (Figs. 1 and 13). *A. dominicana* n. sp. differs in having three rings (subbasal one reduced). Coloration of the rostrum seems particularly stable; basal $2/3$ of rostral segment 1 and entire segment 2 dark; however, in *nigricans* n. sp. only the basal half of segment 2 is darkened.

Coloration of the extremities seems variable and species-characteristic, although certain rings, in particular their size and number, may turn to be variable even within one and the same species. However, it is possible to recognize some colour variations for every species under study. Especially the coloration of the fore legs may be a good character as well: in both *nigricans* n. sp. and *dominicana* n. sp. coxa 1 has three rings, the apical of which is very wide, whereas in *antilliana* n. sp. there is only one narrower ring. Also, the femora and tibiae are differently coloured in the fore legs of the three species in question (compare f_1 and t_1 in Figs. 1, 10 and 13). Coloration of tarsi is different in different species: in *nigricans* n. sp. and *dominicana* n. sp. the 1st tarsal joint is pale and the 2nd one dark, while in *antilliana* n. sp. the entire tarsus is dark. Besides, *dominicana* n. sp. is characterized by a dark base of the claws.

The 1st abdominal segment is black in both *nigricans* n. sp. and *dominicana* n. sp., but in *antilliana* n. sp. it is ochraceous. Coloration of the 1st abdominal segment's spine characterizes every species: black in *nigricans* n. sp., pale brown in *antilliana* n. sp., and ochraceous in *dominicana* n. sp.

The forewings are coloured in such a way as to distinguish the species as well, except for the equally coloured pterostigma with a pale apex of all the three species. The base of the forewing is pale in both *dominicana* n. sp. and *antilliana* n. sp., but black in *nigricans* n. sp.; the large spot covers the base of the discal cell, the shape and distribution of the dark patches of the wing are also different in all the three species compared (Figs. 7, 16, and 20).

An analysis of certain external morphological characters has also revealed significance of some of them in the systematics of the involved species. Thus, the eyes are semiglobular and, consequently, the length of an eye slightly exceeds that of the postocular region (1.2:1) in *nigricans* n. sp. and *dominicana* n. sp., whereas the eyes are globular and three times as long as the postocular part in *antilliana* n. sp. Furthermore, the length ratio of rostral joint 1 and joints 2 and 3 combined is 1:1.35 in *nigricans* n. sp., 1.25:1 in both *dominicana* n. sp. and *antilliana* n. sp. Length ratio of antennomeres 1–4 is almost equal in all the three species in question, although differs a little from species to species; joint 4 with very characteristic internal rings and a distinctly narrowed apex.

The anterior lobe of the pronotum is half as long as the posterior one in all three species, but the lateral margins of the anterior lobe form carinae in *dominicana* n. sp. Besides, *dominicana* n. sp. differs from both *nigricans* n. sp. and *antilliana* n. sp. by more conspicuous flap-like projections of the humeri. The shape of the scutellum is also a good character distinguishing all the three species compared.

The spine of abdominal segment 1 is conspicuously stout in *dominicana* n. sp. and slender in both *nigricans* n. sp. and *antilliana* n. sp.

The fore legs are quite different: femur 1 is rather slender and on the average 16 times as long as wide in both *dominicana* n. sp. and *antilliana* n. sp., but stout and only 8.5 times as long as wide in *nigricans* n. sp. The fore tibiae are always some three quarters the length of the femora. The forewings display perhaps the best diagnostic differences: they are the narrowest (with the length/width ratio as 5:1) in *dominicana* n. sp. and a little broader in both *nigricans* n. sp. and *antilliana* n. sp. (the length/width ratio is 3.6:1 and 3.7:1, respectively); discal cell 3 times as long as wide in *dominicana* n. sp. and 2.6 and 2.3 times as long as wide, respectively, in *nigricans* n. sp. and *antilliana* n. sp.; apical position of discal cell slightly pointed in *nigricans* n. sp. and *dominicana* n. sp., and not pointed at all in *antilliana* n. sp.; distance from apex of pterostigma to tip of wing twice as long as distance from pterostigmal apex to insertion of M in *nigricans* n. sp. and *dominicana* n. sp., and the independent basal part of discal cell is $\frac{1}{5}$ th of its fused portion in both *nigricans* n. sp. and *antilliana* n. sp., but $\frac{1}{4}$ th in *dominicana* n. sp.

8. References

- BARONI URBANI, C. & SAUNDERS, J. B. (1982): The fauna of the Dominican Republic amber: The present status of knowledge. — Trans. 9th Carib. Geol. Conf., Santo Domingo, Dom.Rep., 1980 (1982), 1: 213–223; Santo Domingo.
- POPOV, Y. A. (1987): Synopsis of the Neotropical bug genus *Malacopus* STAL, with the description of a new fossil species from Dominican amber (Heteroptera: Reduviidae, Emesinae). — Stuttgarter Beitr. Naturk., B, 130: 15 S., 13 Abb., 2 Tab.; Stuttgart. — [1987a]
- (1987): A new species of the bug genus *Empicoris* WOLFF from Dominican copal, with the redescription of *E. nudus* McATEE & MALLOCH (Heteroptera: Reduviidae, Emesinae). — Stuttgarter Beitr. Naturk., B, 134: 9 S., 10 Abb.; Stuttgart. — [1987b]
- SCHLEE & GLÖCKNER, W. (1978): Bernstein. — Stuttgarter Beitr. Naturk., C, 8: 1–72, 16 Taf.; Stuttgart.
- WYGODZINSKY, P. W. (1966): A monograph of the Emesinae (Reduviidae, Hemiptera). — Bull. Amer. Mus. Nat. Hist., 133: 1–614; New York.

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